

**INDUSTRIAL MICROBIOLOGY & ENZYME TECHNOLOGY
(BTC2202)**

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Role of hop is essential for production of
 - (a) Beer
 - (b) Wine
 - (c) Spirit
 - (d) None of these
- (ii) Elimination of iron is important for production of
 - (a) Citric acid
 - (b) Gluconic acid
 - (c) Lactic acid
 - (d) None of these
- (iii) Homoserine auxotroph is essential for production of
 - (a) Lysine
 - (b) Glutamic acid
 - (c) Acetic acid
 - (d) None of these
- (iv) Genetic modification may occur by
 - (a) Protoplast fusion
 - (b) Catabolite repression
 - (c) Feedback repression
 - (d) None of these
- (v) Common mutagenic agents are
 - (a) Nitrous acid
 - (b) Hydroxyl amine
 - (c) Bromouracil
 - (d) All of these
- (vi) Ficoll is polymer of
 - (a) Sucrose
 - (b) Glutamic acid
 - (c) Aspartic acid
 - (d) None of these
- (vii) On the basis of mode of action enzymes can be classified into
 - (a) 5 categories
 - (b) 6 categories
 - (c) 4 categories
 - (d) None of these
- (viii) Biosensor which detects change in potential differences is known as
 - (a) Calorimetric biosensor
 - (b) Optical biosensor
 - (c) Piezo-electric biosensor
 - (d) Potentiometric biosensor

- (ix) Immobilization technique where the matrix is activated by cyanogen bromide is known as
 (a) Cross-linking (b) Covalent bonding
 (c) Entrapment (d) Encapsulation
- (x) The bi-functional linker is
 (a) Glutaraldehyde (b) Biotin
 (c) Avidin (d) Agarose

Fill in the blanks with the correct word

- (xi) Transition is type of _____ mutation.
- (xii) Riboflavin is produced as byproduct of _____.
- (xiii) Hydroxyl amine is type of _____ mutagen.
- (xiv) uv radiation is type of _____ mutagen.
- (xv) _____ reactor allows the control of pH.

Group - B

2. (a) Analyse the secondary screening method. [[C03](Analyse/HOCQ)]
 (b) Discuss the industrial applications of microbial exopolysaccharides. [[C04](Remember/LOCQ)]
 (c) Define the scale up process. [[C02](Apply/IOCQ)]
4 + 4 + 4 = 12
3. (a) Analyse different mode of fermentation process. [[C03](Analyse/HOCQ)]
 (b) Briefly discuss the role of citric acid. [[C04](Remember/LOCQ)]
 (c) Describe photoreactivation repair process. [[C02](Apply/IOCQ)]
 (d) Mention any two physical mutagens. [[C02](Apply/IOCQ)]
3 + 3 + 4 + 2 = 12

Group - C

4. (a) Mention the function of borate in gluconic acid recovery. [[C03](Analyse/HOCQ)]
 (b) Why hop is used in beer production process? [[C04](Remember/LOCQ)]
 (c) Explain why two steps are required in acetic acid production. [[C02](Apply/IOCQ)]
 (d) Analyse the role of protease in streptomycin production. [[C02](Apply/IOCQ)]
3 + 3 + 3 + 3 = 12
5. (a) Mention one homo and one hetero polysaccharides and their composition. [[C03](Analyse/HOCQ)]
 (b) What is malolactic acid fermentation? [[C04](Remember/LOCQ)]
 (c) What is the importance of lignocellulose? [[C02](Apply/IOCQ)]
 (d) Explain how penicillin is recovered? [[C02](Apply/IOCQ)]
2 + 4 + 2 + 4 = 12

Group - D

6. (a) Analyse chemical modification of any one enzyme. [[C03](Analyse/HOCQ)]
(b) Discuss the mode of action of glucose isomerase and glucose oxidase. [[C04](Remember/LOCQ)]
(c) Briefly discuss the mode of action of extremophilic enzyme. [[C02](Apply/IOCQ)]
4 + 4 + 4 = 12
7. (a) Analyse the importance of dehydrogenase enzyme. [[C03](Analyse/HOCQ)]
(b) What are extremophilic microbes? [[C04](Remember/LOCQ)]
(c) Briefly discuss the importance of ficoll. [[C02](Apply/IOCQ)]
4 + 4 + 4 = 12

Group - E

8. (a) How can you immobilize enzymes by Adsorption? Write its advantages and limitations. [[C01](Analyse, Remember/IOCQ,LOCQ)]
(b) Briefly describe the working principle of an Optical Biosensor. [[C05](Describe/IOCQ)]
(2 + 2 + 2) + 6 = 12
9. (a) Describe the working principle of Hollow Fibre Reactor as reactor of immobilized enzymes. [[C01](Describe/HOCQ)]
(b) Explain how biosensors can be used in defense. [[C05](Analyse/IOCQ)]
6 + 6 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	25	47.9	27.1

